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(56) Documents cited

EP A2 0074236	US 4162711	US 3861483
US 4289212	US 4019579	US 3819001
US 4210217	US 3865204	

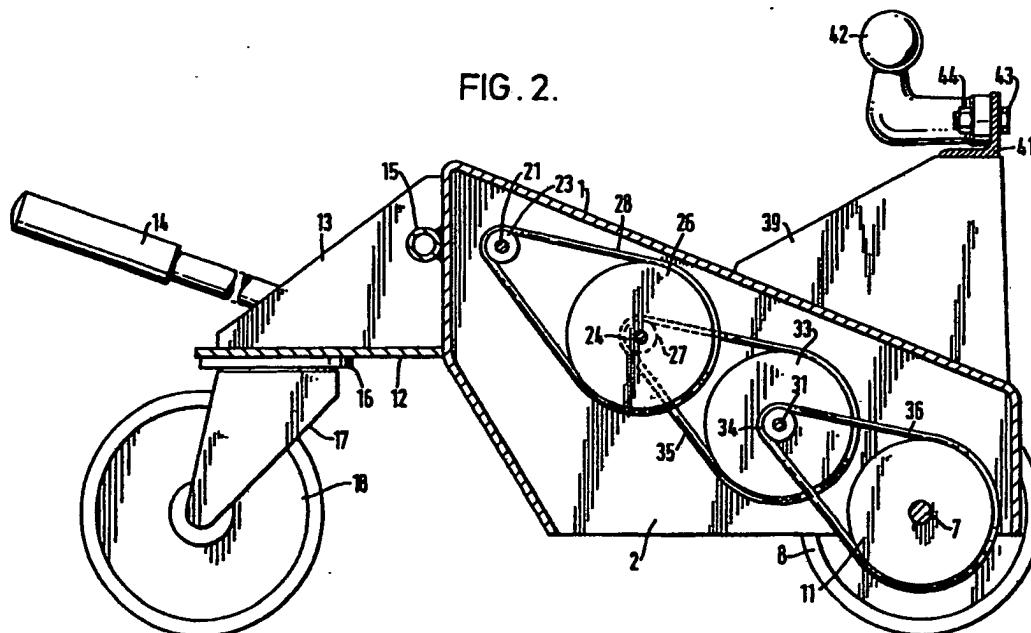
(58) Field of search

B7H  
Selected US specifications from IPC sub-class B62D

## (54) Device for moving trailers, caravans and the like

(57) A device for moving trailers, caravans and the like comprises a frame (1) on which a pair of wheels (8) are mounted on an axle (7) which extends through plates (2) at one end of the frame. An electric motor is mounted on a drive shaft (21) and is arranged to drive the axle (7) via a series of pulleys (23, 26; 27, 34, 35 and 11) and associated belts (28, 35 and 36). A further single wheel (18) is rotatably mounted in a U-shaped frame or caster (17) which is rotatably mounted in a bearing (16) provided on a plate (12) which is secured to the other end of the frame (1). A levering or steering arm or handle (14) is also secured to this end of the frame (1) and a ball coupling (42) for engaging the towing eye of a trailer, caravan or the like is mounted on an L-shaped bar (41) which is secured to gusset plates (39) provided at the said one end of the frame (1). The electric motor may be an electric drill or a fixed motor driven from the main or a battery. Alternatively the motor may be petrol or diesel powered.

FIG. 2.



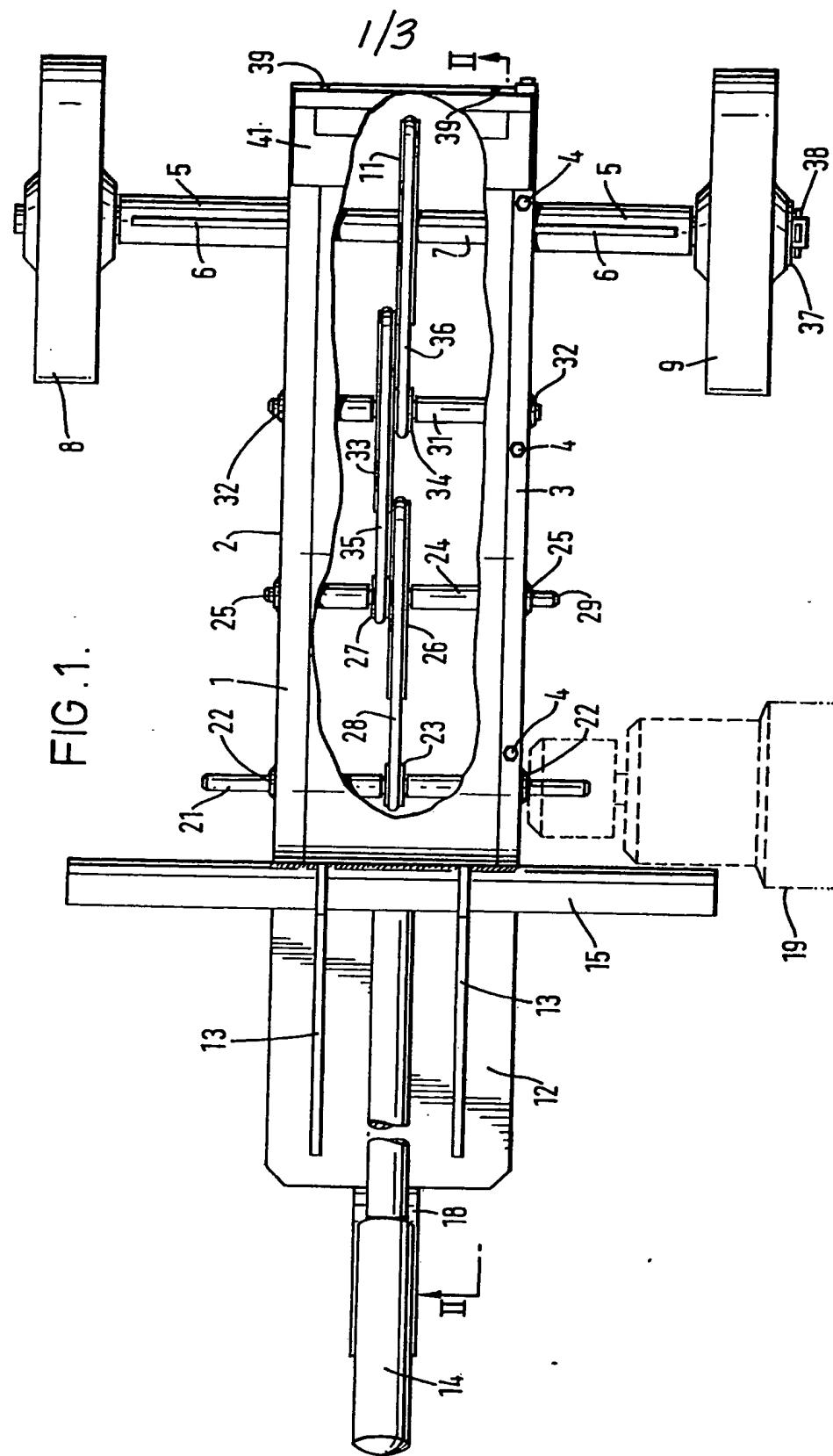
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The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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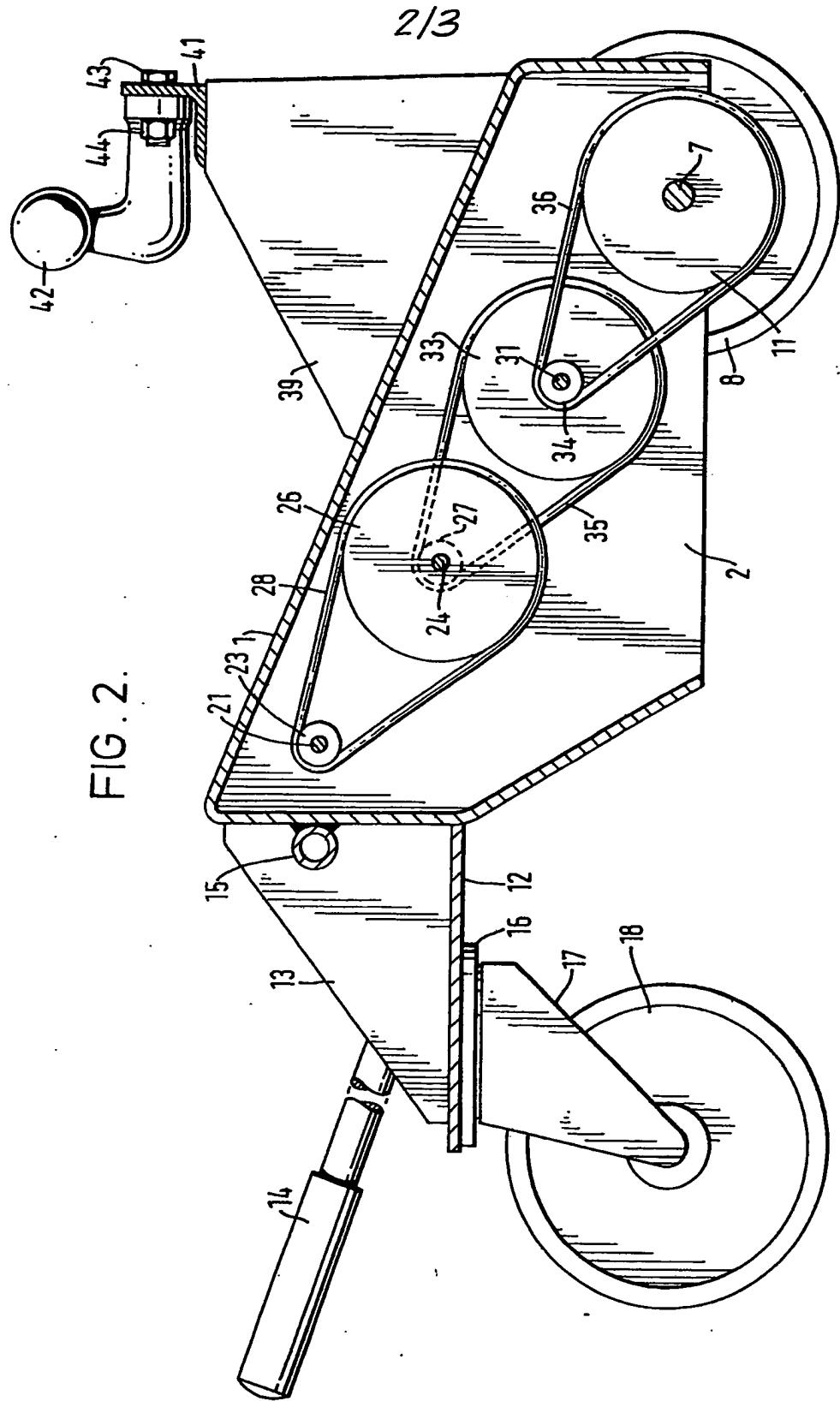
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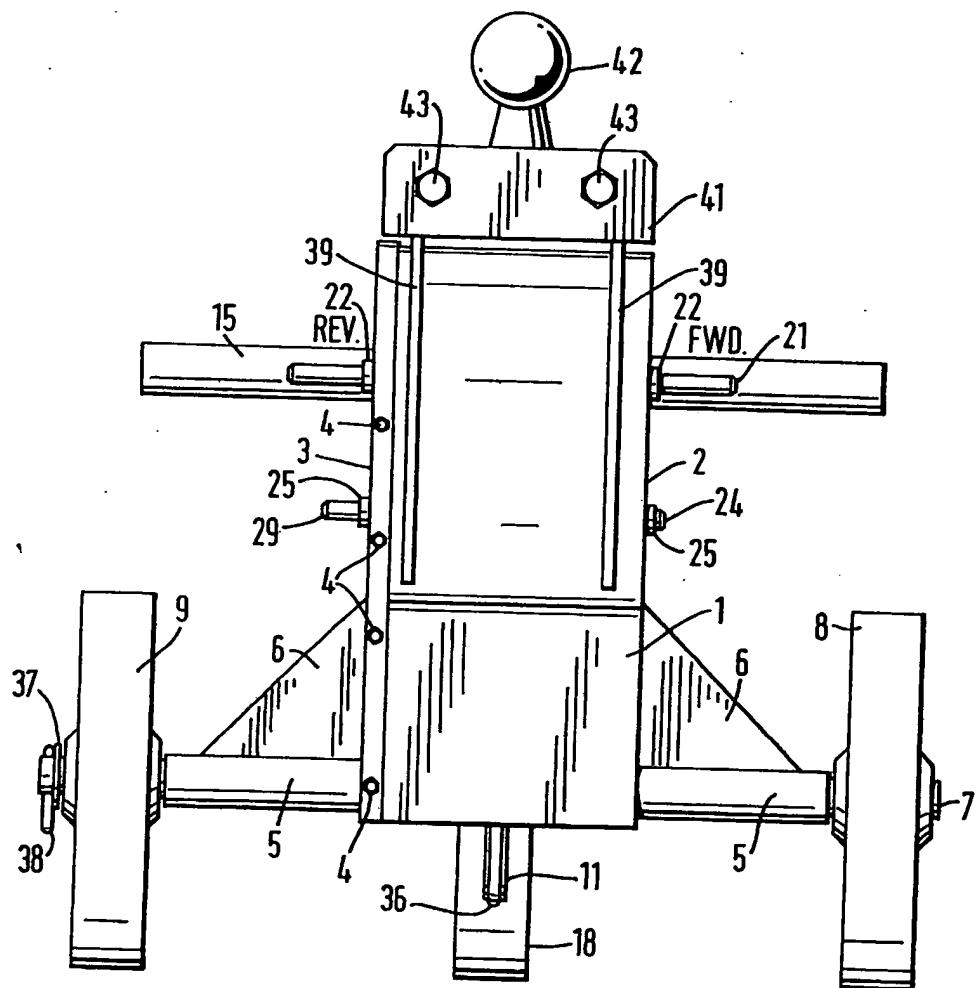
FIG. 2.



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FIG. 3.



**SPECIFICATION****Device for moving trailers, caravans and the like**

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This invention relates to a device for manoeuvring trailers, caravans and the like.

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Situations are frequently encountered when it is not possible to manoeuvre a trailer, caravan or the like by means of a towing vehicle because of limited space available for example in a yard or on a slipway. It is then necessary to manhandle the trailer, caravan or the like and this often involves hard physical effort, 15 even when a jockey wheel is fitted, and may in some circumstances not be possible unless assistance is at hand.

The present invention aims to solve this problem by simple and convenient means.

- 20 According to the invention, there is provided a device for manoeuvring trailers, caravans or the like which comprises a frame, a pair of wheels rotatably mounted on the frame, drive means for driving at least one of said wheels, 25 means on said frame adapted to engage with the towing eye of a trailer, caravan or the like, at least one further wheel pivotally mounted on the frame and a levering bar or handle mounted on the frame.
- 30 Preferably, only one of the wheels of said pair is arranged to be driven, the other wheel of said pair being freely rotatably mounted on an axle which is common to both wheels. The drive means may take the form of an electric 35 motor or an internal combustion engine running on petrol or diesel but an electric motor is preferred. The electric motor may be arranged to be connected to mains electricity or may be powered by a suitable battery which 40 can be mounted on the frame.

According to one embodiment of the invention, the drive means takes the form of a conventional electric drill, the chuck of which is mounted on a drive shaft mounted in bearings on the frame. The drive shaft carries a pulley and a further pulley is mounted on the axle and is arranged to be driven by means of a belt extending over both pulleys. The said one wheel of said pair is fixedly mounted on 50 the axle for rotation therewith. The drive from the drive shaft to the axle may be direct but it is preferred to provide gearing by means of a series of intermediate shafts each carrying a large pulley and a small pulley. The large pulley on the first intermediate shaft is connected to the pulley on the drive shaft by a suitable belt and the small pulley on the first intermediate shaft is connected to the large pulley on the next intermediate shaft by a suitable belt 55 and so on until the small pulley on the last intermediate shaft is connected to a pulley on the axle. Any number of intermediate shafts may be provided but two are preferred. Further, the belts and pulleys may be replaced by 60 suitably toothed gear pinions if desired al-

though this is not preferred for reasons of expense.

The electric motor may be provided with a reversing mechanism. Alternatively, the motor

- 70 may be mounted on one end of the drive shaft for driving the axle in one direction of rotation and on the other end of the drive shaft for driving the axle in the other direction of rotation.
- 75 Preferably, a single further wheel is provided which is rotatably mounted in a U-shaped frame or caster which in turn is rotatably mounted on the frame in a central location at one end thereof. The levering bar or handle 80 preferably projects from this end of the frame and the means for engaging the towing eye of a trailer, caravan or the like are desirably mounted on the other end of the frame and preferably comprise a ball coupling.
- 85 The invention will now be further described, by way of example, with reference to the drawings, in which:

Fig. 1 is a plan view of one embodiment of a device according to the invention with part

- 90 of the casing of the frame cut-away to show internal components;

Fig. 2 is a section taken on the line II-II in Fig. 1; and

- Fig. 3 is an end view of the device shown 95 in Figs. 1 and 2.

Referring to the drawings, the device comprises a frame 1 to one side of which a first side plate 2 is secured by welding or the like and to the other side of which a second side

- 100 plate 3 is secured by means of screws 4. Secured to each of the side plates 2,3 is a respective tube 5, a bore being provided in each of the side plates which is surrounded by the associated tube 5 and a reinforcing web or gusset 6 is welded to each of the tubes 5 and the associated side plate 2 or 3. An axle 7 extends through the tubes 5 and the frame 1, a pulley 11 being mounted on that part of the axle which is located in the 110 frame. Each bore in the side plates 2 and 3 is provided with a bearing (not shown) in which the axle 7 is mounted to permit the axle to rotate freely with respect to the frame. A first wheel 8 is fixedly mounted on one end of the 115 axle 7 for rotation therewith and a second wheel 9 is rotatably mounted on bearings at the other end of the axle 7 to permit relative rotation to take place between the axle 7 and the wheel 9.

- 120 The axle 7 is mounted in the side plates 2 and 3 at one end of the frame 1 and to the other end of said frame, on the outer side thereof, is secured a substantially horizontal plate 12, this plate being reinforced by gussets 13 secured, for example by welding,

- both to the plate 12 and to the frame 1. A levering or steering arm or handle 14 is also secured to the said other end of the frame 1 as is a substantially horizontal abutment bar 15, the securing preferably being achieved by

welding.

Secured to the underside of the plate 12 in a bearing 16 is a U-shaped frame or caster 17 in which is rotatably mounted a further 5 wheel 18, the arrangement being such that the wheel 18 is free to rotate and pivot with respect to the plate 12 and hence the frame 1.

A drive shaft 21 is mounted in bearings 22 10 in the side plates 2 and 3 and extends across the frame 1 at a level substantially equal to and adjacent to the abutment bar 15. As shown in Fig. 1, the ends of the drive shaft 21 project outwardly from the side plates 2 and 3 to permit, for example, the chuck of an 15 electric drill 19 to be mounted on either one or both of the projecting ends of the drive shaft. A small pulley 23 is mounted on the drive shaft 21 on that portion which is located 20 within the frame 1 between the side plates 2 and 3.

A first intermediate shaft 24 is mounted in bearings 25 in the side plates 2 and 3 and likewise extends across the frame 1 parallel to 25 but spaced from the drive shaft 21. A large pulley 26 and a small pulley 27 are mounted on the intermediate shaft 24 on that portion of the shaft which is located within the frame 1 between the side plates 2 and 3 and the 30 large pulley 26 is connected to the pulley 23 on the drive shaft 21 by a belt 28. One end 29 of the shaft 24 projects for some distance outwardly from the side plate 3 to facilitate removal and refitting of said side plate from 35 and to the frame 1.

A second intermediate shaft 31 is mounted in bearings 32 in the side plates 2 and 3 and likewise extends across the frame 1 parallel to but spaced from the intermediate shaft 24 and 40 the axle 7. A large pulley 33 and a small pulley 34 are mounted on the intermediate shaft 31 on that portion of the shaft which is located within the frame 1 between the side plates 2 and 3. The large pulley 33 is connected to the small pulley 27 on the shaft 24 45 by a belt 35 and the small pulley 34 is connected to the pulley 11 on the axle 7 by a belt 36.

The pulleys 23, 26, 27, 33 and 34 are preferably secured to the respective shafts 21, 24 and 31 and the pulley 11 is preferably secured to the axle 7 by welding. It will be seen from Fig. 2 that the pulley and belt arrangement provides a gearing which enables the 55 relatively fast speed of rotation of the electric motor 19 to be geared down to a relatively slow drive speed of the axle 7 which is imparted to the drive wheel 8.

The belts 28, 35 and 36 may be provided 60 with adjustable tensioning means (not shown) and, to enable adjustment and other maintenance work to be carried out, the side plate 3 can be removed from the frame 1 by undoing the screws 4. In order that the side plate can 65 be removed completely, the wheel 9, which is

freely rotatably mounted on the axle 7, is detachable from the axle 7, a washer 37 and a split pin 38 being provided so that, when fitted, the wheel 9 is normally retained on the end of the axle 7.

Finally, a pair of gusset plates 39 are secured, for example by welding, to the top of the frame 1 at said one end and an L-shaped bar 41 is secured, for example by welding, to 70 these gusset plates. A conventional ball coupling 42 (not shown in Fig. 1) is secured by bolts 43 and nuts 44 to the bar 41 by means of which a towing eye of a trailer, caravan or the like (not shown) can be engaged with the 80 device.

Once engaged, the wheel 9 can be driven by the motor 19 and the device steered by means of the steering arm or handle 14 so that the trailer, caravan or the like like can be 85 moved to any desired location without difficulty and without demanding any undue physical effort.

By fitting the motor 19 to one end of the shaft 21, the wheel 9 can be driven in one 90 direction of rotation to move the device and hence a trailer, caravan or the like attached thereto in a forwards direction, for example, and, by fitting the electric motor 19 to the other end of the shaft 21, the wheel 9 can be 95 driven in the opposite direction of rotation to move the device and the attached trailer, caravan or the like in a rearwards direction for example. As an alternative, the motor 19 may be provided with a reversing mechanism in 100 which case the motor need only be fitted to one or the other end of the shaft 21 in order to achieve forwards or rearwards movement of the device.

It will thus be seen that the device according 105 to the invention enables a trailer, caravan or the like to be easily moved in a restricted area in which the use of a towing vehicle is not possible.

The invention is not restricted to the above-described embodiment but modifications are possible. For example, an electric motor may be permanently mounted on the frame 1 or on the plate 12 and arranged to drive the shaft 21 indirectly. The motor may be arranged to 110 be powered by mains electricity or by a battery which can also be mounted on the frame 1 or on the plate 12.

The device according to the invention can be made small and convenient to use, preferred dimensions being about half a metre for the length of the frame, with the levering arm or handle projecting from the frame by a distance of about 60 cm, and an overall width of the device of about 45 cm. The ball coupling 115 42 should desirably be located about 50 cm. above the ground.

#### CLAIMS

1. A device for manoeuvring trailers, caravans or the like, said device comprising a

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- frame, a pair of wheels rotatably mounted on the frame, drive means for driving at least one of said wheels, means on said frame adapted to engage with the towing eye of a trailer,
- 5 caravan or the like, at least one further wheel pivotally mounted on the frame and a levering bar or handle mounted on the frame.
2. A device according to claim 1, wherein only one of said pair of wheels is arranged to
- 10 be driven by the drive means.
3. A device according to claim 2, wherein the other wheel of said pair of wheels is freely rotatably mounted on an axle which is common to both wheels.
- 15 4. A device according to claim 3, wherein the drive means comprises a motor arranged to drive a drive shaft mounted in bearings on the frame and wherein said drive shaft is arranged to drive the axle by means of at least
- 20 one pair of pulleys.
5. A device according to claim 4, wherein at least one intermediate shaft is rotatably mounted in the frame, said intermediate shaft carrying a first pulley connected by a first belt
- 25 to a pulley on the drive shaft and a second pulley connected by a second belt to a pulley on the axle or on a further intermediate shaft.
6. A device according to claim 5, wherein two intermediate shafts are provided, the second pulley on the first-mentioned intermediate shaft being connected by the second belt to a first pulley on the second intermediate shaft and a second pulley on the second intermediate shaft being connected by a third belt to
- 35 the pulley on the axle.
7. A device according to claim 3, wherein the drive means comprises a motor arranged to drive a drive shaft mounted in bearings on the frame and wherein the drive shaft is arranged to drive the axle by means of gearing.
- 40 8. A device according to any preceding claim, wherein the drive means comprises an electric motor.
9. A device according to any one of claims
- 45 4 to 8, wherein the motor is provided with a reversing mechanism.
10. A device according to any preceding claim, wherein a single said further wheel is provided which is rotatably mounted in a U-shaped frame or caster rotatably mounted in turn on the frame in a central location at one end thereof.
- 50 11. A device according to claim 10, wherein the levering bar or handle projects from the said one end of the frame.
- 55 12. A device according to claim 10 or claim 11, wherein the means adapted to engage with the towing eye of a trailer, caravan or the like are mounted on the other end of the frame.
- 60 13. A device according to claim 12, wherein the towing eye engaging means comprise a ball coupling.
- 65 14. A device for manoeuvring trailers, caravans or the like, said device being substan-

tially as described herein with reference to the drawings.

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